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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,310	12/04/2003	Marvin M. Johnson	2253-01101	9636

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EXAMINER
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GRIFFIN, WALTER DEAN

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 01/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/728,310

Applicant(s)

JOHNSON ET AL.

Examiner

Walter D. Griffin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/23/04, 3/25/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 10-12, 17-19, 21, 26, 27, 40, 41, and 47-49 are rejected under 35

U.S.C. 102(b) as being anticipated by Johnson et al. (US 3,755,488).

The Johnson reference discloses a hydrogenation process. The process comprises contacting an olefin stream that contains alkynes with an absorbent to selectively absorb the alkynes and to produce an alkyne-enriched absorbent phase. The absorbent is then contacted with hydrogen and a catalyst under hydrogenation conditions including co-current flow in a reactor such as a fixed bed or trickle bed reactor to hydrogenate the alkynes in the absorbent. The absorbent is then separated from the mono olefins produced in the hydrogenation step. The absorbent may be NMP. The catalyst comprises a Group VIII metal on a support such as alumina. In the hydrogenation step, the alkynes are essentially completely converted. This clearly discloses the hydrogenation of 90% or more of the alkynes. See column 1, lines 21-26 and 58-68 and column 2, line 1 through column 3, line 54.

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*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 42-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 3,755,488).

The Johnson reference discloses a hydrogenation process. The process comprises contacting an olefin stream that contains alkynes with an absorbent to selectively absorb the alkynes and to produce an alkyne-enriched absorbent phase. The absorbent is then contacted with hydrogen and a catalyst under hydrogenation conditions including co-current flow in a reactor such as a fixed bed or trickle bed reactor to hydrogenate the alkynes in the absorbent. The

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absorbent is then separated from the mono olefins produced in the hydrogenation step. The absorbent may be NMP. The catalyst comprises a Group VIII metal on a support such as alumina. In the hydrogenation step, the alkynes are essentially completely converted. This clearly discloses the hydrogenation of 90% or more of the alkynes. The separation may be performed by any conventional means. Examples include stripping (i.e., use of a partitioning fluid) and distillation. See column 1, lines 21-26 and 58-68 and column 2, line 1 through column 3, line 54.

The Johnson reference does not disclose that the distillation is operated at the claimed conditions to recover the claimed percent of alkene, does not disclose the recovery of the claimed percent of alkene when using the partitioning fluid, and does not disclose the use of a flash drum.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Johnson by using a flash drum because, as stated by Johnson, one would use any conventional separation method and the use of a flash drum is conventional.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Johnson by operating the separation to recover the claimed percentage of alkenes because alkenes are the desired product of Johnson and one would use conditions that would optimize the recovery of the desired alkenes.

Claims 4, 13-16, 22-25, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 3,755,488) in view of Dai et al. (US 2002/0068843 A1).

As discussed above, the Johnson reference does not disclose that the catalyst comprises a second metal as in claims 4, 13-16, 22-25, 29 and 30.

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The Dai reference discloses a selective hydrogenation catalyst that contains metals such as those claimed in claims 4, 13-16, 22-25, 29, and 30. See paragraphs [0010]-[0019].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Johnson by utilizing a catalyst that contains the metals as in claims 4, 13-16, 22-25, 29, and 30 as suggested by Dai because catalysts that contain these metals have higher selectivity and activity.

Claims 20, 28, 34, 50, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 3,755,488) in view of Reimer et al. (US 6,365,790 B2).

As discussed above, the Johnson reference does not disclose the inclusion of carbon monoxide in the hydrogen gas stream.

The Reimer reference discloses a process for the hydrogenation of alkynes in the liquid phase in which carbon monoxide is included in the hydrogen gas. See column 1, lines 6-12 and column 2, line 63 through column 3, line 40.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Johnson by including carbon monoxide in the hydrogen gas as suggested by Reimer because the selectivity to desired products will be increased.

Claims 5-9, 31-33, 35, 36, 38, 39, and 52-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 3,755,488) in view of Dai et al. (US 2002/0068843 A1) and Reimer et al. (US 6,365,790 B2).

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As discussed above, the Johnson reference does not disclose that the catalyst comprises a second metal as claimed and does not disclose the inclusion of carbon monoxide in the hydrogen gas stream.

The Dai reference discloses a selective hydrogenation catalyst that contains metals such as those claimed. See paragraphs [0010]-[0019].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Johnson by utilizing a catalyst that contains the metals as in the claims as suggested by Dai because catalysts that contain these metals have higher selectivity and activity.

The Reimer reference discloses a process for the hydrogenation of alkynes in the liquid phase in which carbon monoxide is included in the hydrogen gas. See column 1, lines 6-12 and column 2, line 63 through column 3, line 40.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Johnson by including carbon monoxide in the hydrogen gas in any amount that provides for the desired hydrogenation as suggested by Reimer because the selectivity to desired products will be increased.

Claims 4, 13-16, 22-25, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 3,755,488) in view of GB 871804.

As discussed above, the Johnson reference does not disclose that the catalyst comprises a second metal as in claims 4, 13-16, 22-25, 29 and 30.

The GB reference discloses a selective hydrogenation catalyst that contains metals such as those claimed. Specifically, gallium, zinc, and indium are disclosed. See page 1, lines 51-80.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Johnson by utilizing a catalyst that contains the metals as in the claims as suggested by the GB reference because catalysts that contain these metals have improved activity in producing the desired olefin products.

Claims 5-9, 31-33, 35-37, 39, 52-54, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 3,755,488) in view of GB 871804 and Reimer et al. (US 6,365,790 B2).

As discussed above, the Johnson reference does not disclose that the catalyst comprises a second metal as claimed and does not disclose the inclusion of carbon monoxide in the hydrogen gas stream.

The GB reference discloses a selective hydrogenation catalyst that contains metals such as those claimed. Specifically, gallium, zinc, and indium are disclosed. See page 1, lines 51-80.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Johnson by utilizing a catalyst that contains the metals as in the claims as suggested by the GB reference because catalysts that contain these metals have improved activity in producing the desired olefin products.

The Reimer reference discloses a process for the hydrogenation of alkynes in the liquid phase in which carbon monoxide is included in the hydrogen gas. See column 1, lines 6-12 and column 2, line 63 through column 3, line 40.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Johnson by including carbon monoxide in



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the hydrogen gas in any amount that provides for the desired hydrogenation as suggested by Reimer because the selectivity to desired products will be increased.

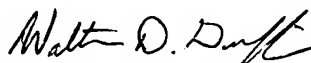
### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art not relied upon discloses hydrogenation processes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is (571) 272-1447. The examiner can normally be reached on Monday-Friday 6:30 to 4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Walter D. Griffin  
Primary Examiner  
Art Unit 1764

WG  
December 27, 2004